[0113] When the confirmed LOD value in operation s**1510** is the same as or greater than the prescribed value, in operation s**1530**, first color values are obtained with respect to a coordinate of each pixel. For example, the first color values are obtained by using bilinear interpolation, based on a coordinate of each pixel of the quad, a center coordinate of each texel of the upper mipmap corresponding to each pixel of the quad, and a color value of each texel of the upper mipmap corresponding to each pixel of the quad.

[0114] FIG. **16** is a view illustrating a method of texture filtering according to an LOD value, according to an embodiment.

[0115] The method according to an embodiment with reference to the example of FIG. **16** determines the LOD value according to how close an upper mipmap **1610**, a lower mipmap **1620** and a pixel **1600** are. For example, the LOD value is 1 when the pixel **1600** is located in the upper mipmap and is 0 when the pixel **1600** is located in the lower mipmap. In this example, the LOD value is between 0 and 1. Therefore, the pixel **1600** is close to the upper mipmap when the LOD value is larger than 0.5 and is close to the lower mipmap when the LOD value is less than 0.5.

[0116] According to such a method of performing tri-linear filtering by obtaining a center coordinate of pixels forming a quad in the upper mipmap, accuracy is considerably degraded when the LOD value is considerably high. Because a color value of a pixel is considerably affected by an upper mipmap because the pixel is closer to the upper mipmap as an LOD value is larger, total accuracy is considerably degraded when accuracy of an operation with respect to the upper mipmap is degraded. Therefore, if the LOD value is less than a prescribed value, for example, 0.5, color values of pixels included in a quad, in which the color values of pixels correspond to the upper mipmap, are obtained by using bilinear interpolation, based on a center coordinate located in a center of a coordinate of each pixel, a coordinate located in a center of each texel, and color values of texels, according to an embodiment. However, if the LOD value is same as or greater than a prescribed value, color values of pixels included in a quad, in which the color values of pixels correspond to the upper mipmap, are obtained by using bilinear interpolation, based on a coordinate of each pixel of the quad, a center coordinate of each texel of the upper mipmap corresponding to each pixel of the quad, and a color value of each texel of the upper mipmap corresponding to each pixel of the quad.

[0117] For example, since the pixel is closer to the upper mipmap because the LOD value is larger than 0.5 in the above example, a color value of each pixel corresponding to the upper mipmap and the lower mipmap is obtained by using bilinear interpolation, with respect to each pixel corresponding to the quad, equally in the upper mipmap and the lower mipmap. Next, a tri-linear filtering value or color value is obtained by using bilinear interpolation with respect to a color value of each pixel corresponding to the upper mipmap and the lower mipmap.

[0118] The apparatuses, units, modules, devices, and other components illustrated in FIGS. **1-16** that perform the operations described herein with respect to FIGS. **1-16** are implemented by hardware components. Examples of hardware components include controllers, sensors, generators, drivers, memories, comparators, arithmetic logic units, adders, subtractors, multipliers, dividers, integrators, and any other electronic components known to one of ordinary skill in the art. In one example, the hardware components are implemented by computing hardware, for example, by one or more processors or computers. A processor or computer is implemented by one or more processing elements, such as an array of logic gates, a controller and an arithmetic logic unit, a digital signal processor, a microcomputer, a programmable logic controller, a field-programmable gate array, a programmable logic array, a microprocessor, or any other device or combination of devices known to one of ordinary skill in the art that is capable of responding to and executing instructions in a defined manner to achieve a desired result. In one example, a processor or computer includes, or is connected to, one or more memories storing instructions or software that are executed by the processor or computer. Hardware components implemented by a processor or computer execute instructions or software, such as an operating system (OS) and one or more software applications that run on the OS, to perform the operations described herein with respect to FIGS. **1-16**. The hardware components also access, manipulate, process, create, and store data in response to execution of the instructions or software. For simplicity, the singular term "processor" or "computer" may be used in the description of the examples described herein, but in other examples multiple processors or computers are used, or a processor or computer includes multiple processing elements, or multiple types of processing elements, or both. In one example, a hardware component includes multiple processors, and in another example, a hardware component includes a processor and a controller. A hardware component has any one or more of different processing configurations, examples of which include a single processor, independent processors, parallel processors, single-instruction single-data (SISD) multiprocessing, single-instruction multiple-data (SIMD) multiprocessing, multiple-instruction single-data (MISD) multiprocessing, and multiple-instruction multiple-data (MIMD) multiprocessing.

[0119] The methods illustrated in FIGS. **1-16** that perform the operations described herein with respect to FIGS. **1-16** are performed by computing hardware, for example, by one or more processors or computers, as described above executing instructions or software to perform the operations described herein.

[0120] Instructions or software to control a processor or computer to implement the hardware components and perform the methods as described above are written as computer programs, code segments, instructions or any combination thereof, for individually or collectively instructing or configuring the processor or computer to operate as a machine or special-purpose computer to perform the operations performed by the hardware components and the methods as described above. In one example, the instructions or software include machine code that is directly executed by the processor or computer, such as machine code produced by a compiler. In another example, the instructions or software include higher-level code that is executed by the processor or computer using an interpreter. Programmers of ordinary skill in the art can readily write the instructions or software based on the block diagrams and the flow charts illustrated in the drawings and the corresponding descriptions in the specification, which disclose algorithms for performing the operations performed by the hardware components and the methods as described above.